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EXAMINER	
SHEW, JOHN	

ART UNIT	PAPER NUMBER
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/092,289	MOTT, JAMES A.
	Examiner	Art Unit
	John L. Shew	2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 3/14/2006.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-6,8-22,26-37,40-49,52-54,57-61,63,65 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 13-22 and 26-31 is/are allowed.

6)☒ Claim(s) 1-6,8-12,32-37,40-49,52-54,57-61,63 and 65 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 3, 4, 5, 6, 9, 10, 11, 65, 32, 35, 36, 37, 41, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cidon et al. (Patent No. 5367517) in view of Roberts (Pub. No. US 2002/0057651 A1).

Claim 1, Cidon teaches a method of dynamically controlling the rate of communication between two entities (Abstract lines 1-8) referenced by the bandwidth reservation between a source node and a destination node, the method comprising receiving an electronic communication (col. 2 lines 8-13) referenced by the transmission of a request packet from a source node to a destination node, for a first channel between a first entity and a second entity (Fig. 1, col. 2 lines 50-67, col. 3 lines 1-22) referenced by the Automatic Network Routing link 5 between Node 0 and Node 3, at a relay element situated between the first entity and the second entity (Fig. 1, col. 3 lines 23-37) referenced by intermediate Node 1 located between Node 0 and Node 3, retrieving from

said communication a modifiable first value associated with a first target bandwidth for said first channel (Fig. 1, Fig. 2B, Fig. 3A, Fig. 3D) referenced by the Bandwidth Allocation Device receiving the bandwidth B_max value which is modified from a value of B_Θ to B_Θ/2, retrieving from said communication a fixed second value associated with a desired bandwidth for said first channel (Fig. 3A) referenced by the bandwidth B_min value which remains at a fixed value of B_ Θ/3, determining whether said relay element can provide said first target bandwidth for said first channel (col. 3 lines 38-48) referenced by the determination if the ANR link 5 can support a bandwidth greater than B_min but less than B_max, and modifying said first value in said communication to a value associated with a decreased first target bandwidth if said relay element cannot provide said first target bandwidth for said channel (col. 3 lines 38-48) referenced by the BAD for outgoing ANR link 5 replacing the B_max in the reservation request packet with B_maxn1 wherein B_maxn1 is the maximum bandwidth of Node 1 which is less than B_max. Cidon does not teach wherein the desired bandwidth is never less than said first target bandwidth.

Roberts teaches the desired bandwidth is never less than said first target bandwidth. (Fig. 3B, page 4 para. [0039]) referenced by the predetermined Guaranteed Rate 330 is never less than the variable Available Rate 350 which is initially assigned based on QoS.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro-flow management of Roberts to the system of resources request of Cidon for the purpose of providing a network with an improved

quality of service based upon per-flow state information as suggested by Roberts (page 3 para. [0023]).

Claim 2, Cidon teaches further comprising forwarding said communication (Fig. 1, Fig. 2B, col. 4 lines 13-16) referenced by Node 1 sending a outgoing ANR link 12 with a non-zero bandwidth request to Node 2, wherein said first value in said forwarded communication indicates a bandwidth allocated to said first channel by said relay element (Fig. 1, Fig. 3B, col. 6 lines 51-67, col. 7 lines 1-5) referenced by the reservation request packet with the bandwidth modification of B(0)=B_0 sent over the ANR link 12 by Node 1.

Claim 3, Cidon teaches further comprising prior to said determining receiving a set of communications on a set of channels through said switching element not including said first channel (Fig. 4, Fig. 6, col. 9 lines 51-67, col. 10 lines 19-24) referenced by the Node 24 equivalent to Node 1 receiving multiple bandwidth request packets for route links 34 38 62 and links 42 38 72 70 68 66 each representing different set of channels, retrieving from said set of communications a set of values associated with target bandwidths for said set of channels (Fig. 3B) referenced by the bandwidth request packet for each respective route inclusive of the bandwidth B_max value, and summing said target bandwidths to calculate a total allocated bandwidth for said relay element (Fig. 7, col. 10 lines 25-42) referenced by the Compare Request With Available Resources Step 724 to calculate the available bandwidth.

Claim 4, Cidon teaches wherein said determining comprises comparing said total allocated bandwidth to a maximum bandwidth of said relay element (Fig. 7, col. 10 lines 25-42) referenced by the Receive Request Packet At A Node Step 720 which includes the bandwidth B_max value and Compare Request With Available Resources Step 724 which is the total available bandwidth of the node, and if said maximum bandwidth exceeds said total allocated bandwidth by a difference of more than said first target bandwidth (Fig. 7, col. 10 lines 25-42) referenced by result of Step 724 Available Resources >= Request, determining that said relay element can provide said first target bandwidth for said first channel (Fig. 7, col. 10 lines 25-42) referenced by Decrease Available Resource By Request Step 726 wherein the node provides the target bandwidth by reducing its total available bandwidth resources.

Claim 5, Cidon teaches wherein said determining comprises comparing said first target bandwidth for said first channel to a previous bandwidth granted to said first channel by said relay element (col. 3 lines 38-48) referenced by the comparison of target bandwidth B_maxn1 being greater than previous bandwidth B_min which is the minimum bandwidth which must be granted to allow for data transmission, and if said first target bandwidth is greater than said previous bandwidth comparing a difference between said first target bandwidth and said previous bandwidth with an unallocated bandwidth of said relay element (Fig. 7, col. 10 lines 25-42) referenced by Compare Request With Available Resources Step 724 followed by Decrease Available Resource By Request

Step 726 wherein the node provides the target bandwidth by reducing its unallocated available bandwidth resources.

Claim 6, Cidon teaches wherein said modifying comprises changing said first value to a value associated with zero bandwidth (col. 3 lines 49-62) referenced by the determination if the bandwidth of at least B_min cannot be supported then the Bandwidth Allocation Device replaces the B_max value with 0.

Claim 9, Cidon teaches wherein said electronic communication is a packet (col. 2 lines 8-13) referenced by the transmission of a request packet from a source node to a destination node.

Claim 10, Cidon teaches wherein said relay element is a switch (Fig. 1, col. 1 lines 35-42) referenced by the switching node between the source and the destination nodes, and wherein said first entity and said second entity are computer systems (Fig. 1, col. 9 lines 41-50) referenced by the use of computer communications for routing methods thus the nodes are computer based.

Claim 11, Cidon teaches wherein one of said first entity and said second entity is a computer system (Fig. 1, col. 9 lines 41-50) referenced by the use of computer communications for routing methods thus the nodes are computer based, and wherein the other of said first entity and said second entity is an input/output subsystem (Fig. 2B,

col. 3 lines 13-22) referenced by the nodes each receiving input data and a Bandwidth Allocation Device for output data.

Claim 65, Cidon teaches wherein said modifying comprises replacing said modifiable first value with a modified first value associated with a lower target bandwidth (Fig. 3C, Fig. 3D, col. 7 lines 6-39) referenced by the replacement of B_max from the initial bandwidth value of B_Θ to the modified lower bandwidth value of B_Θ/2, the method further comprising at said relay element allocating the lower target bandwidth to said first channel (Fig. 1, col. 7 lines 6-39) referenced by node 2 is able only to support bandwidth B_Θ/2 thus allocating the lower bandwidth to the B_max value, and at another relay element downstream of said relay element (Fig. 1) referenced by downstream node 3, receiving said electronic communication containing said modified first value and said fixed second value (Fig 1, Fig. 3D, col. 7 lines 22-39) referenced by the packet transmission over ANR link 16 from node 2 to node 3 containing modified B_max and fixed B_min. Cidon does not teach allocating to said first channel a bandwidth higher than the lower target bandwidth.

Roberts teaches allocating to said first channel a bandwidth higher than the lower target bandwidth (Fig. 3B, page 5 para. [0046]-[0047] referenced by the use of Maximum Rate which is higher than the Available Rate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro-flow management of Roberts to the system of resources request of Cidon for the purpose of providing a network with an improved

quality of service based upon per-flow state information as suggested by Roberts (page 3 para. [0023]).

Claim 32, Cidon teaches a method of controlling a network communication rate (Abstract lines 1-8) referenced by the bandwidth reservation between a source node and a destination node, the method comprising receiving at a downstream intermediate node (Fig. 1, col. 2 lines 50-67) referenced by the downstream intermediate node 2, a fixed value representing a desired rate of communication for a channel between a first network node and a second network node (Fig. 3C, col. 7 lines 6-21) referenced by the bandwidth B_min which is fixed at value B_Θ/3 for communication between node 0 and node 3, and a modifiable value representing a target rate of communication allocated to the channel by an upstream intermediate node (Fig. 1, Fig. 2B, Fig. 3A, Fig. 3D) referenced by the Bandwidth Allocation Device receiving the bandwidth B_max value which is modified from a value of B_Θ to B_Θ/2, if the downstream intermediate node does not have sufficient available bandwidth to conduct communications on the channel at a rate equal to said target rate (col. 7 lines 22-39) referenced by the node 2 determination it cannot support a bandwidth of B_Θ but only B_Θ/2, adjusting said modifiable value such that the intermediate node can conduct communications on the channel at an adjusted rate represente by said adjusted modifiable value (Fig. 3D, col. 7 lines 22-39) referenced by the insertion of the decreased bandwidth value of B_Θ/2 for B_max. Cidon does not teach at the downstream intermediate node allocating to the

channel a rate of communication higher than the target rate of communication if the downstream intermediate node has sufficient available bandwidth.

Roberts teaches the downstream intermediate node allocating to the channel a rate of communication higher than the target rate of communication if the downstream intermediate node has sufficient available bandwidth (Fig. 3B, page 5 para. [0046]-[0047] referenced by the determination QoS descriptors for the use of Maximum Rate which is higher than the Available Rate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro-flow management of Roberts to the system of resources request of Cidon for the purpose of providing a network with an improved quality of service based upon per-flow state information as suggested by Roberts (page 3 para. [0023]).

Claim 35, Cidon teaches wherein if said modifiable value is adjusted to a first threshold value the first network node stops sending communications toward the second network node through the channel (Fig. 1, col. 3 lines 49-62) referenced by the decrease of the bandwidth B_max to a threshold value of zero wherein Node 1 will deallocate the bandwidth reserved by a Bandwidth Allocation Device which ceases data transmission over ANR link 5 between Node 0 and Node 3.

Claim 36, Cidon teaches wherein if said modifiable value received at the downstream intermediate node is adjusted to a second threshold value (Fig. 1, col. 3 lines 49-62)

referenced by the bandwidth value B_min value received at Node 1 which is a threshold to which the B_max can be allocated before it is changed from the value of 0 to restart transmission, the first network node sends communications toward the second network node through the channel a maximum rate (Fig. 1, col. 2 lines 50-58) referenced by where B_max equals B_min thus the transmission rate is set to the maximum rate through the intermediate Node 1 between Node 0 and Node 3.

Claim 37, Cidon teaches further comprising notifying the first network node of said adjusted modifiable value wherein the first network node then transmits communications toward the second network node through the channel at said adjusted rate (col. 5 lines 21-39) referenced by the bandwidth reply packet back to the source Node 0 with a modified B_max as the maximum bandwidth transmission rate between Node 0 and Node 3.

Claim 41, Cidon teaches wherein the downstream intermediate node is a switch (Fig. 1, col. 1 lines 35-42) referenced by the switching node between the source and the destination nodes.

Claim 47, Cidon teaches wherein the downstream intermediate node is a computer (Fig. 1, col. 9 lines 41-50) referenced by the use of computer communications for routing methods thus the nodes are computer based.

Claims 8, 33, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cidon and Roberts as applied to claims 1, 32 above, and further in view of Gubbi (Patent No. US 6934752).

Claim 8, Cidon teaches a method of bandwidth reservation using bandwidth B_max values between link entities. Cidon and Roberts do not teach the first value is a time value representing a time between communication transmissions from the first entity to the second entity on said first channel.

Gubbi teaches a first value is a time value representing a time between communication transmissions from the first entity to the second entity on said first channel (Fig. 32, col. 37 lines 14-25) referenced by the Dynamic Bandwidth Request including a Latency Request 322 expressed in Time Unit microseconds.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Dynamic Bandwidth Request message of Gubbi to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of dynamically negotiating for the priority bandwidth and the retransmission parameters for each stream separately to optimize network capacity as suggested by Gubbi (col. 6 lines 7-11).

Claim 33, Cidon teaches a method of bandwidth reservation using bandwidth B_max values between link entities. Cidon does not teach each said value corresponds to a time between communications transmitted from the first network node to the second network node.

Gubbi teaches each said value corresponds to a time between communications transmitted from the first network node to the second network node (Fig. 32, col. 37 lines 14-25) referenced by the Dynamic Bandwidth Request including a Latency Request 322 expressed in Time Unit microseconds.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Dynamic Bandwidth Request message of Gubbi to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of dynamically negotiating for the priority bandwidth and the retransmission parameters for each stream separately to optimize network capacity as suggested by Gubbi (col. 6 lines 7-11).

Claim 34, Cidon teaches decreasing a rate value (col. 3 lines 38-48) referenced by the replacement of the B_max value by the lower B_maxn1 value in the bandwidth request packet. Cidon does not teach said adjusting comprises increasing said time between communications.

Gubbi teaches adjusting rate value comprises increasing a time between communications (Fig. 32, col. 37 lines 14-25) referenced by the Dynamic Bandwidth Request including a Latency Request 322 expressed in Time Unit microseconds which

is the inverse of the BW Req 321 expressed in bytes/second such that a decrease adjustment in BW results in an increase in latency.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Dynamic Bandwidth Request message of Gubbi to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of dynamically negotiating for the priority bandwidth and the retransmission parameters for each stream separately to optimize network capacity as suggested by Gubbi (col. 6 lines 7-11).

Claims 12, 42, 43, 45, 48, 49, 52, 54, 57, 58, 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cidon (Patent No. 5367517) and Roberts (Pub. No. US 2002/0057651 A1) as applied to claim 32 above, and further in view of Heatwole et al. (Patent No. US 6937580).

Claim 12, Cidon teaches a method of dynamically controlling the rate of communication between two entities (Abstract lines 1-8) referenced by the bandwidth reservation between a source node and a destination node, the method comprising receiving an electronic communication (col. 2 lines 8-13) referenced by the transmission of a request packet from a source node to a destination node, for a first channel between a first entity and a second entity (Fig. 1, col. 2 lines 50-67, col. 3 lines 1-22) referenced by the

Automatic Network Routing link 5 between Node 0 and Node 3, at a relay element situated between the first entity and the second entity (Fig. 1, col. 3 lines 23-37) referenced by intermediate Node 1 located between Node 0 and Node 3, retrieving from said communication a modifiable first value associated with a first target bandwidth for said first channel (Fig. 1, Fig. 2B, Fig. 3A, Fig. 3D) referenced by the Bandwidth Allocation Device receiving the bandwidth B_max value which changes from B_Θ to B_Θ/2, retrieving from said communication a fixed second value associated with a desired bandwidth for said first channel (Fig. 3A) referenced by the bandwidth B_min value which remains at a fixed value of B_ Θ/3, determining whether said relay element can provide said first target bandwidth for said first channel (col. 3 lines 38-48) referenced by the determination if the ANR link 5 can support a bandwidth greater than B_min but less thatn B_max, and modifying said first value in said communication to a value associated with a decreased first target bandwidth if said relay element cannot provide said first target bandwidth for said channel (col. 33 lines 38-48) referenced by the BAD for outgoing ANR link 5 replacing the B_max in the reservation request packet with decreased B_maxn1 wherein B_maxn1 is the maximum bandwidth of Node 1. Cidon does not teach wherein the desired bandwidth is never less than said first target bandwidth.

Roberts teaches the desired bandwidth is never less than said first target bandwidth (Fig. 3B, page 4 para. [0039]) referenced by the predetermined Guaranteed Rate 330 is never less than the variable Available Rate 350 which is initially assigned based on QoS.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro-flow management of Roberts to the system of resources request of Cidon for the purpose of providing a network with an improved quality of service based upon per-flow state information as suggested by Roberts (page 3 para. [0023]).

Cidon and Roberts do not teach a computer readable storage medium storing instructions.

Heatwole teaches a computer readable storage medium storing instructions that when executed by a computer cause the computer to perform a method (Fig. 9, col. 15 lines 57-67, col. 16 lines 1-8) referenced by the computer system 901 with Main Memory 907 for storing information and instructions to be executed by Processor 905.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth capacity apportioning system of Heatwole to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of enhancing efficient utilization of system capacity as suggested by Heatwole (col. 2 lines 11-12).

Claim 42, Cidon teaches a downstream intermediate node for bandwidth reservation.

Cidon and Roberts do not teach the downstream intermediate node is a router.

Heatwole teaches an intermediate node is a router (Fig. 1, col. 4 lines 50-57) referenced by the use of a multi-port router.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth capacity apportioning system of Heatwole to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of enhancing efficient utilization of system capacity as suggested by Heatwole (col. 2 lines 11-12).

Claim 43, Cidon teaches a downstream intermediate node for bandwidth reservation. Cidon and Roberts do not teach the downstream intermediate node is a hub. Heatwole teaches an intermediate node is a hub (Fig. 2, col. 5 lines 62-65) referenced by the use of a hub 201 for communication with terminals.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth capacity apportioning system of Heatwole to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of enhancing efficient utilization of system capacity as suggested by Heatwole (col. 2 lines 11-12).

Claim 45, Cidon teaches a downstream intermediate node for bandwidth reservation. Cidon and Roberts do not teach the downstream intermediate node is a repeater. Heatwole teaches an intermediate node is a repeater (Fig. 2, col. 5 lines 62-65) referenced by the use of a hub 201 for signal amplification of communications with terminals.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth capacity apportioning system of Heatwole to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of enhancing efficient utilization of system capacity as suggested by Heatwole (col. 2 lines 11-12).

Claim 48, Cidon teaches a downstream intermediate node for bandwidth reservation. Cidon and Roberts do not teach the downstream intermediate node is a communication bus.

Heatwole teaches an intermediate node is a communication bus (Fig. 9, col. 15 lines 57-67) referenced by the use of a Bus 903 within the computer system 901.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth capacity apportioning system of Heatwole to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of enhancing efficient utilization of system capacity as suggested by Heatwole (col. 2 lines 11-12).

Claim 49, Cidon teaches a method of controlling a network communication rate (Abstract lines 1-8) referenced by the bandwidth reservation between a source node and a destination node, the method comprising receiving at a downstream intermediate node (Fig. 1, col. 2 lines 50-67) referenced by the downstream intermediate node 2, a fixed value representing a desired rate of communication for a channel between a first

network node and a second network node (Fig. 3C, col. 7 lines 6-21) referenced by the bandwidth B_min which is fixed at value B_Θ/3 for communication between node 0 and node 3, and a modifiable value representing a target rate of communication allocated to the channel by an upstream intermediate node (Fig. 1, Fig. 2B, Fig. 3A, Fig. 3D) referenced by the Bandwidth Allocation Device receiving the bandwidth B_max value which is modified from a value of B_Θ to B_Θ/2, if the downstream intermediate node does not have sufficient available bandwidth to conduct communications on the channel at a rate equal to said target rate (col. 7 lines 22-39) referenced by the node 2 determination it cannot support a bandwidth of B_Θ but only B_Θ/2, adjusting said modifiable value such that the intermediate node can conduct communications on the channel at an adjusted rate represente by said adjusted modifiable value (Fig. 3D, col. 7 lines 22-39) referenced by the insertion of the decreased bandwidth value of B_Θ/2 for B_max. Cidon does not teach at the downstream intermediate node allocating to the channel a rate of communication higher than the target rate of communication if the downstream intermediate node has sufficient available bandwidth.

Roberts teaches the downstream intermediate node allocating to the channel a rate of communication higher than the target rate of communication if the downstream intermediate node has sufficient available bandwidth (Fig. 3B, page 5 para. [0046]-[0047] referenced by the determination QoS descriptors for the use of Maximum Rate which is higher than the Available Rate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro-flow management of Roberts to the system of

resources request of Cidon for the purpose of providing a network with an improved quality of service based upon per-flow state information as suggested by Roberts (page 3 para. [0023]).

Cidon and Roberts do not teach a computer readable storage medium storing instructions.

Heatwole teaches a computer readable storage medium storing instructions that when executed by a computer cause the computer to perform a method (Fig. 9, col. 15 lines 57-67, col. 16 lines 1-8) referenced by the computer system 901 with Main Memory 907 for storing information and instructions to be executed by Processor 905.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth capacity apportioning system of Heatwole to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of enhancing efficient utilization of system capacity as suggested by Heatwole (col. 2 lines 11-12).

Claim 52, Cidon teaches a data structure configured to indicate a rate of communication over a communication channel (Fig. 3A, col. 6 lines 32-50) referenced by the bandwidth request packet including seven element bandwidth B_max and first element link ANR 5, the data structure comprising a header portion (Fig. 3A, col. 6 lines 32-50) referenced by the bandwidth request packet, comprising an identifier of an originator of said data structure (Fig. 3B, col. 6 lines 32-60) referenced by the fifth element of the Source address BB, an identifier of a destination of said data structure (Fig. 3B, col. 6 lines 32-

60) referenced by the third element of the Destination address AA, and a first value corresponding to a target bandwidth between said originator and said destination (Fig. 3B, col. 6 lines 32-60) referenced by the eighth element bandwidth B_max=B_0, and a second value corresponding to a requested bandwidth between said originator and said destination wherein said second value is fixed (Fig. 3B) referenced by the bandwidth B_min value which remains at a fixed value of B_ Θ/3, and wherein said first value is modifiable during transmission of said data structure from said originator to said destination (col. 3 lines 38-48) referenced by the replacement of B_max by B_maxn1 which is the bandwidth supported by Node 1 for ANR 5. Cidon does not teach the target bandwidth represented by said first value can never be greater than requested bandwidth.

Roberts teaches the target bandwidth represented by said first value can never be greater than requested bandwidth (Fig. 3B, page 4 para. [0039]) referenced by Available Rate 350 which is initially assigned based on QoS is not greater than predetermined Guaranteed Rate 330.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro-flow management of Roberts to the system of resources request of Cidon for the purpose of providing a network with an improved quality of service based upon per-flow state information as suggested by Roberts (page 3 para. [0023]).

Cidon and Roberts do not teach a computer readable storage medium.

Heatwole teaches a computer readable storage medium (Fig. 9, col. 15 lines 57-67, col. 16 lines 1-8) referenced by the computer system 901 with Main Memory 907 for storing information and instructions to be executed by Processor 905.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth capacity apportioning system of Heatwole to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of enhancing efficient utilization of system capacity as suggested by Heatwole (col. 2 lines 11-12).

Claim 54, Cidon teaches a data structure further comprising a data portion comprising a set of data (Fig. 3D, col. 7 lines 22-29) referenced by the second element data $$.

Claim 57, Cidon teaches an apparatus for dynamically adjusting the rate of communications between a first entity and a second entity on a channel (Abstract lines 1-8, Fig. 1) referenced by the bandwidth reservation processing by an intermediate node between a source node and a destination node over ANR link 5, comprising a communication port configured to forward a communication received from a first entity toward a second entity on a communication channel (Fig. 1, col. 2 lines 50-60, Fig. 2B, col. 3 lines 13-22) referenced by the Node 1 link ANR 5 which is a port using Bandwidth Allocation Devices to transmit/receive the bandwidth request/reply packets between source node Node 0 and destination node Node 3, a first memory configured to store said communication (Fig. 3A, col. 6 lines 32-50) referenced by the bandwidth request

packet received from Node 0 to Node 1 such that the fields and parameter must be stored by Node 1 for processing, a second memory configured to store a target bandwidth for said channel wherein said target bandwidth is indicated by a modifiable first value in said communication (Fig. 3B, col. 6 lines 51-66, Fig 3D, col. 7 lines 22-39) referenced by the bandwidth request packet with the eighth element of the bandwidth B_max which is the target bandwidth provided by Node 1 and is subject to change based on node capacity allocation, a third memory configured to store a requested bandwidth for said channel (Fig. 3B) referenced by the tenth element B(Θ) which stores the bandwidth allocation of prior nodes, a comparator configured to compare one of said target bandwidth and said requested bandwidth to an available bandwidth for said port (Fig. 7, col. 10 lines 25-42) referenced by Compare Request With Available Resources Step 724 which compares the available bandwidth with the requested bandwidth, and a processor configured to adjust said first value to indicate a different target bandwidth (Fig. 7, col. 10 lines 25-42) referenced by Decrease Available Resources By Request Step 726 which adjust B_max to the available bandwidth, if the available bandwidth is insufficient to allow a bandwidth equal to said target bandwidth to be allocated to said channel (Fig. 7, col. 10 lines 25-42) referenced by Compare Request With Available Resources Step 724 with a result Available Resources >= Request, wherein said target bandwidth indicated by said first value received in said communication is the bandwidth allocated to said channel upstream of said port (Fig. 7, col. 10 lines 25-42) referenced by the allocation of the bandwidth and the corresponding Decrease Available Resources By Request Step 726. Cidon does not teach wherein said requested

bandwidth is indicated by a fixed second value in said communication is never less than said target bandwidth.

Roberts teaches wherein a requested bandwidth is indicated by a fixed second value in the communication is never less than a target bandwidth (Fig. 3B, page 4 para. [0039]) referenced by the predetermined Guaranteed Rate 330 is never less than the variable Available Rate 350 which is initially assigned based on QoS, allocate to a channel a bandwidth equal to a target bandwidth up to a requested bandwidth if the available bandwidth is sufficient (page 5 para. [0051], Fig. 6, page 6 para. [0056]) referenced by the determination if the assigned rate is exceeded wherein if equal micro-flow packet data is constructed for transmission up to the max rate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro-flow management of Roberts to the system of resources request of Cidon for the purpose of providing a network with an improved quality of service based upon per-flow state information as suggested by Roberts (page 3 para. [0023]).

Claim 58, Cidon teaches further comprising an extractor configured to extract said first value and said second value from said communications (Fig. 2B, col. 3 lines 13-20, Fig. 3A, col. 6 lines 32-50) referenced by the Bandwidth Allocation Device which processes the bandwidth request packet to obtain the B_max and B_min values.

Claim 63, Cidon teaches wherein said processor is configured to adjust said first value to indicate a lower target bandwidth if said apparatus is unable to provide said target bandwidth (col. 3 lines 38-48) referenced by the replacement of the B_max value by the B_maxn1 value if the B_max value cannot be supported.

Claims 40, 44, 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cidon and Roberts as applied to claim 32 above, and further in view of Gasbarro et al. (Pub No. US 2002/0071450 A1).

Claim 40, Cidon teaches a downstream intermediate packet switched node. Cidon does not teach the downstream intermediate node is InfiniBand compliant.

Gasbarro teaches a node is InfiniBand compliant (Fig. 6, page 2 para. [0013]) referenced by the computer host system using InfiniBand architectures.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth-optimizing host fabric adaptor of Gasbarro to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of maximizing memory bandwidth access performance of a memory architecture while occupying minimal memory area as suggested by Gasbarro (page 1 para. [0006]).

Claim 44, Cidon teaches a downstream intermediate node. Cidon and Roberts do not teach the downstream intermediate node is a bridge.

Gasbarro teaches a node is a bridge (Fig. 4A, page 4 para. [0039]) referenced by the I/O bridge 208 function of the Host node 130.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth-optimizing host fabric adaptor of Gasbarro to the micro-flow bandwidth reservation method of Cidon and Roberts for the purpose of maximizing memory bandwidth access performance of a memory architecture while occupying minimal memory area as suggested by Gasbarro (page 1 para. [0006]).

Claim 46, Cidon teaches a downstream intermediate node. Cidon and Roberts do not teach the downstream intermediate node is a network adapter.

Gasbarro teaches a node is a network adapter (Fig. 5, Abstract lines 1-7) referenced by Host Fabric Adapter 120A of the Host System 500.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bandwidth-optimizing host fabric adaptor of Gasbarro to the micro-flow bandwidth reservation method of Cidon and Robertsfor the purpose of maximizing memory bandwidth access performance of a memory architecture while occupying minimal memory area as suggested by Gasbarro (page 1 para. [0006]).

Claims 53, 59, 60, 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cidon, Roberts and Heatwole as applied to claims 52, 57 above, and further in view of Gubbi (Patent No. US 6934752 B1).

Claim 53, Cidon, Roberts and Heatwole teach a computer readable storage medium containing a data structure. Cidon teaches wherein said first value of said header portion of said data structure comprises a target rate of communication (Fig. 3B, col. 6 lines 32-60) referenced by the eighth element bandwidth B_max=B_0. Cidon, Roberts and Heatwole do not teach a time period and said target rate of communication is substantially equal to the inverse of said time period.

Gubbi teaches the rate of communication indicated by the time period is substantially equal to the inverse of the time period (Fig. 32, col. 37 lines 14-25) referenced by the Dynamic Bandwidth Request including Total Bandwidth Request 321 in bytes per second corresponding to the Latency Request.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Dynamic Bandwidth Request message of Gubbi to the bandwidth reservation method of Cidon, Roberts and Heatwole for the purpose of dynamically negotiating for the priority bandwidth and the retransmission parameters for each stream separately to optimize network capacity as suggested by Gubbi (col. 6 lines 7-11).

Claim 59, Cidon teaches wherein each of said first value and second value comprises a bandwidth (col. 2 lines 50-57) referenced by the bandwidths B_max and B_min. Cidon does not teach a time period representing a delay between communication transmissions from said first entity toward said second entity on said channel.

Gubbi teaches a time period representing a delay between communication transmission from a first entity toward a second entity on a channel (Fig. 32, col. 37 lines 14-25) referenced by the Dynamic Bandwidth Request including the Latency Request 322 in Time Units of seconds which represents a time delay between communications, the apparatus further comprising an inverter configured to invert said time period (Fig. 32, col. 37 lines 14-25) referenced by the use of Bandwidth Request 321 in bytes/sec which is an inversion of the Latency Request in seconds which is obtained through an inversion calculation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Dynamic Bandwidth Request message of Gubbi to the bandwidth reservation method of Cidon, Roberts and Heatwole for the purpose of dynamically negotiating for the priority bandwidth and the retransmission parameters for each stream separately to optimize network capacity as suggested by Gubbi (col. 6 lines 7-11).

Claim 60, Cidon teaches further comprising an adder configured to add said target bandwidth indicated by said first value of said communication to a target bandwidth indicated by a value within a previous communication on a different channel to calculate

a total bandwidth allocated by said port (Fig. 7, col 10 lines 25-42) referenced by the Compare Request With Available Resources Step 726 wherein the Node must add the prior assignment of bandwidth of different channels to determine the current available resources with the addition of the requested bandwidth B_max to determine if total resources are exceeded.

Claim 61, Cidon teaches wherein said available bandwidth is substantially equal to a maximum bandwidth of said port minus said total allocated bandwidth (col. 3 lines 38-48, Fig. 7, col 10 lines 25-42) referenced by the Compare Request With Available Resources Step 726 wherein the available resources represent the total current available bandwidth with the determination if Available Resource >= Request then the Decrease Available Resource By Request Step 726 is performed.

Allowable Subject Matter

2. Claims 13-22, 26-30, 31 are allowed.

Citation of Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pub. No. US 2002/0021678 A1, Heatwole et al. discloses a method of apportioning bandwidth capacity in communication switching systems.

Response to Arguments

The proposed amendments and arguments has been fully considered. Cidon does not disclose a fixed bandwidth and a modifiable bandwidth wherein the fixed value can never be less than the modifiable value. The amended limitation "wherein the desired bandwidth is never less than said first target bandwidth" necessitated a new prior art search. An updated prior art search reveals Roberts discloses the limitation not taught by Cidon.

Claims 1, 12 and 65 are rejected based on the Roberts prior art disclosing the amended limitation.

Claims 13 and 31 are allowed with the incorporation of the subject matter of claim 25 and intervening subject matter of claims 23 and 24.

Claims 32 and 49 are rejected based on the Roberts prior art disclosing the amended limitation.

Claim 52 is rejected based on the Roberts prior art disclosing the amended limitation.

Claim 57 is rejected based on the Roberts prior art disclosing the amended limitation.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John L. Shew whose telephone number is 571-272-3137. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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